

**PCT**  
**INTERNATIONAL SEARCH REPORT**  
(PCT Article 18 and Rules 43 and 44)

25 OCT 2004

|   |   |  |
|---|---|--|
| Applicant's or agent's file reference<br>305343863        | <b>FOR FURTHER ACTION</b><br>see Form PCT/ISA/220<br>as well as, where applicable, item 5 below |  |
| International application No.<br><b>PCT/AU2004/001071</b> | International filing date (day/month/year)<br>11 August 2004                                    | (Earliest) Priority Date (day/month/year)<br>1 December 2003 |
| Applicant<br>DYNAMIC HEARING PTY LTD et al                |   |  |

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of **3** sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

**Basis of the report**

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ The international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).
- b. ☐ With regard to any nucleotide and/or amino acid sequence disclosed in the international application, see Box No. I.
2. ☐ Certain claims were found unsearchable (See Box No. II).
3. ☐ Unity of invention is lacking (See Box No. III).
4. With regard to the **title**,
- ☒ the text is approved as submitted by the applicant.
- ☐ the text has been established by this Authority to read as follows:
5. With regard to the **abstract**,
- ☒ the text is approved as submitted by the applicant.
- ☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.
6. With regard to the **drawings**,
- a. the figure of the drawings to be published with the abstract is Figure No. **3**
- ☒ as suggested by the applicant.
- ☐ as selected by this Authority, because the applicant failed to suggest a figure.
- ☐ as selected by this Authority, because this figure better characterizes the invention.
- b. ☐ none of the figures is to be published with the abstract.

## A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl. <sup>7</sup>: H04R 3/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
WPAT, USPTO, Esp@cenet: signal, direction, adaptive, pattern, weight, microphone, gain, add and similar terms

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages                                   | Relevant to claim No. |
|-----------|--|-----------------------|
| A         | WO 2004/057914A1 (OTICON A/S), 8 July 2004<br>whole document   |                       |
| A         | WO 2003/017718A1 (NANYANG TECHNOLOGICAL UNIVERSITY CENTRE FOR SIGNAL PROCESSING), 27 February 2003<br>whole document |                       |
| A         | WO 2001/097558A2 (GN RESOUND CORPORATION), 20 December 2001<br>whole document  |                       |
| A         | WO 2001/095666A2 (NANYANG TECHNOLOGICAL UNIVERSITY), 13 December 2001<br>whole document                              |                       |

☐ Further documents are listed in the continuation of Box C☒ See patent family annex

|   |  |
|---|--|
| * Special categories of cited documents:  |  |
| "A" document defining the general state of the art which is not considered to be of particular relevance  | "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention  |
| "E" earlier application or patent but published on or after the international filing date   | "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone   |
| "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) | "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art |
| "O" document referring to an oral disclosure, use, exhibition or other means  | "&" document member of the same patent family  |
| "P" document published prior to the international filing date but later than the priority date claimed  |  |

Date of the actual completion of the international search  
20 September 2004

Date of mailing of the international search report

1 OCT 2004

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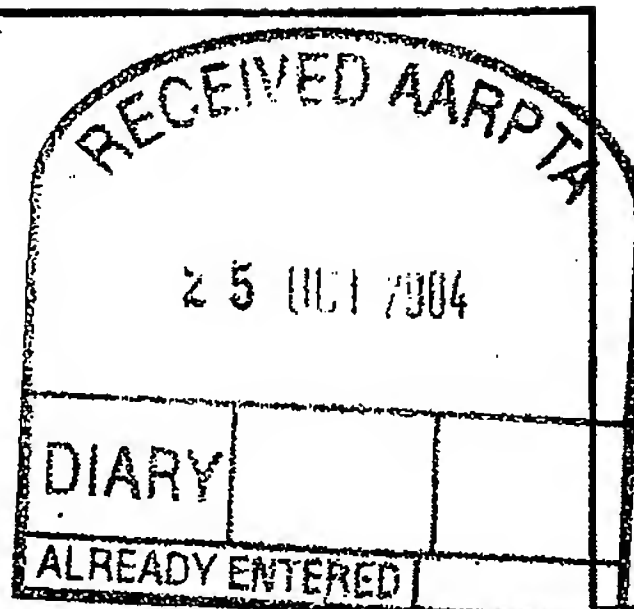
This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

| Patent Document Cited in<br>Search Report   |             | Patent Family Member |            |
|---|-------------|----------------------|------------|
| WO  | 2004/057914 | NONE                 |            |
| WO  | 2003/017718 | NONE                 |            |
| WO  | 2001/097558 | US                   | 2002041695 |
| WO  | 2001/095666 | AU                   | 51208/00   |
| Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001. |             |                      |            |
| END OF ANNEX  |             |                      |            |

From the:  
INTERNATIONAL SEARCHING AUTHORITY

To:

Allens Arthur Robinson  
Patent & Trademark Attorneys  
GPO Box 1776Q  
MELBOURNE VIC 3001



**PCT**

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing  
(day/month/year) 1 OCT 2004

Applicant's or agent's file reference  
305343863

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
**PCT/AU2004/001071**

International filing date (day/month/year)  
11 August 2004

Priority date (day/month/year)  
1 December 2003

International Patent Classification (IPC) or both national classification and IPC  
Cl. 7 H04R 3/00

Applicant

**DYNAMIC HEARING PTY LTD et al**

1. This opinion contains indications relating to the following items:

- |                                     |              |  |
|-------------------------------------|--------------|--|
| <input checked="" type="checkbox"/> | Box No. I    | Basis of the opinion   |
| <input type="checkbox"/>            | Box No. II   | Priority   |
| <input type="checkbox"/>            | Box No. III  | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability   |
| <input type="checkbox"/>            | Box No. IV   | Lack of unity of invention   |
| <input checked="" type="checkbox"/> | Box No. V    | Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/>            | Box No. VI   | Certain documents cited  |
| <input type="checkbox"/>            | Box No. VII  | Certain defects in the international application   |
| <input type="checkbox"/>            | Box No. VIII | Certain observations on the international application  |

**2. FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the IPEA/AU  
AUSTRALIAN PATENT OFFICE  
PO BOX 200, WODEN ACT 2606, AUSTRALIA  
E-mail address: pct@ipaustalia.gov.au  
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Authorized Officer  
**MANISH RAJ**  
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Box No. I      Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.  
☐ This opinion has been established on the basis of a translation from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material  
☐ a sequence listing  
☐ table(s) related to the sequence listing
  - b. format of material  
☐ in written format  
☐ in computer readable form
  - c. time of filing/furnishing  
☐ contained in the international application as filed.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application no.

PCT/AU2004/001071

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

|                               |               |     |
|-------------------------------|---------------|-----|
| Novelty (N)                   | Claims 1 - 31 | YES |
|                               | Claims        | NO  |
| Inventive step (IS)           | Claims 1 - 31 | YES |
|                               | Claims        | NO  |
| Industrial applicability (IA) | Claims 1 - 31 | YES |
|                               | Claims        | NO  |

2. Citations and explanations:

Claims 1-31 are novel and involve inventive step because no individual citation or obvious combination of citations teach or suggest an apparatus or method for producing an adaptive directional signal from a weighted sum of a first signal having an omni-directional polar pattern and a second signal having a bi-directional polar pattern wherein weights are calculated to give the combined signal a constant gain in a predetermined direction and to minimise the power of the combined signal", as claimed in the independent claims 1 and 20.

Claims 1-31 have industrial applicability because the invention claimed can be used in producing signals in digital hearing aids.